

DORYLAIMUS BAYLYI SP. NOV. (DORYLAIMIDAE, DORYLAIMIDA) A NEMATODE COLLECTED FROM SEDIMENT IN A FRESHWATER ROCK-HOLE IN THE NORTHERN TERRITORY

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Summary

NICHOLAS, W. L. & HODDA, M. (2000) *Dorylaimus baylyi* sp. nov. (Dorylaimidae, Dorylaimida) a nematode collected from sediment in a freshwater rock-hole in the Northern Territory. *Trans. R. Soc. S. Aust.* **124**(2), 163-168, 30 November, 2000.

A new species of *Dorylaimus* is described from the sediment of a freshwater rock-hole in the Northern Territory, Australia. It is distinguished from other species by a combination of characters: the cuticle has about 30 longitudinal ridges in the mid region of the body, the odontostyle varies from 43 to 46 µm in length with an aperture covering 43 to 46% of its length and is about ten times as long as it is in diameter, the male tail is short and rounded and the female tail is conoid, terminating in a short flagellum, the spicules are 55-61 µm long, and there are 22-25 supplements in a contiguous row.

KEY WORDS. *Dorylaimus*, freshwater, nematode, rock-hole, taxonomy.

Introduction

Nematodes of the genus *Dorylaimus* Dujardin 1845 are among the most commonly occurring freshwater nematodes and are obvious because of their large size. The genus has been little studied in Australia. Late last century Cobb described *D. latus* Cobb 1891 from grass and *D. spiralis* Cobb 1893 from carrots near Sydney and *D. minus* Cobb 1893, *D. subsimilis* Cobb 1893, *D. pusillus* Cobb 1893 and *D. perfectus* Cobb 1893 from sugar cane in northern NSW. At the time, the concept of the genus was much broader than it is now, *Dorylaimus* being the only genus in what is now regarded as the superfamily Dorylaimoidea. Cobb's descriptions are insufficient to place these taxa even to genus. All were described from females, only the first and last named were illustrated and no type specimens were designated.

The USDA Nematode Collection contains three species, labelled *Dorylaimus monohystera*, *Dorylaimus miser* and *Dorylaimus perfectus* collected from soil under wheat at Nhill, Victoria and donated by Thorne in September 1963. *Dorylaimus monohystera* was later transferred to the genus *Eumenicus* and *D. miser* to *Eudorylaimus* (Thorne 1974) and the specimens of *D. perfectus* appear to be more correctly placed in the genus *Mesodorylaimus*.

Bishop (1974) observed that nematodes of the

genus *Dorylaimus* were common in temporary freshwater pools near Sydney but published no descriptions and kept no voucher specimens. Hodda *et al.* (in press) collected aquatic nematodes extensively throughout southeastern Australia and confirmed that in that environment members of the genus are often present.

This paper presents a description of a new *Dorylaimus* collected by I. Bayly from a rock-hole (gamma) at Warumbi Hill in The Northern Territory in 1991. Subsequent sampling of the type locality by Dr Bayly yielded further dorylaims but no additional specimens of the new species.

Type and Voucher specimens are deposited in the National Nematode Collection (ANIC) at the CSIRO Division of Entomology, Canberra ACT.

Materials and Methods

Specimens collected with a 0.15 mm mesh net were fixed in 70% alcohol. For processing they were washed in water and transferred to 5% aqueous glycerol. The water was slowly evaporated and the specimens were transferred to anhydrous glycerol in which they were mounted for microscopy with cover slips supported by glass beads of the appropriate size. Measurements were made from camera lucida drawings. All measurements were along the curved median line.

One specimen was washed in water and post-fixed in aqueous OsO₄, washed again in water and freeze dried. The specimen was mounted on a metal stub, coated with gold/palladium and examined and photographed in the scanning electron microscope.

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Dorylaimus baylyi sp. nov.
(FIGS 1-14)

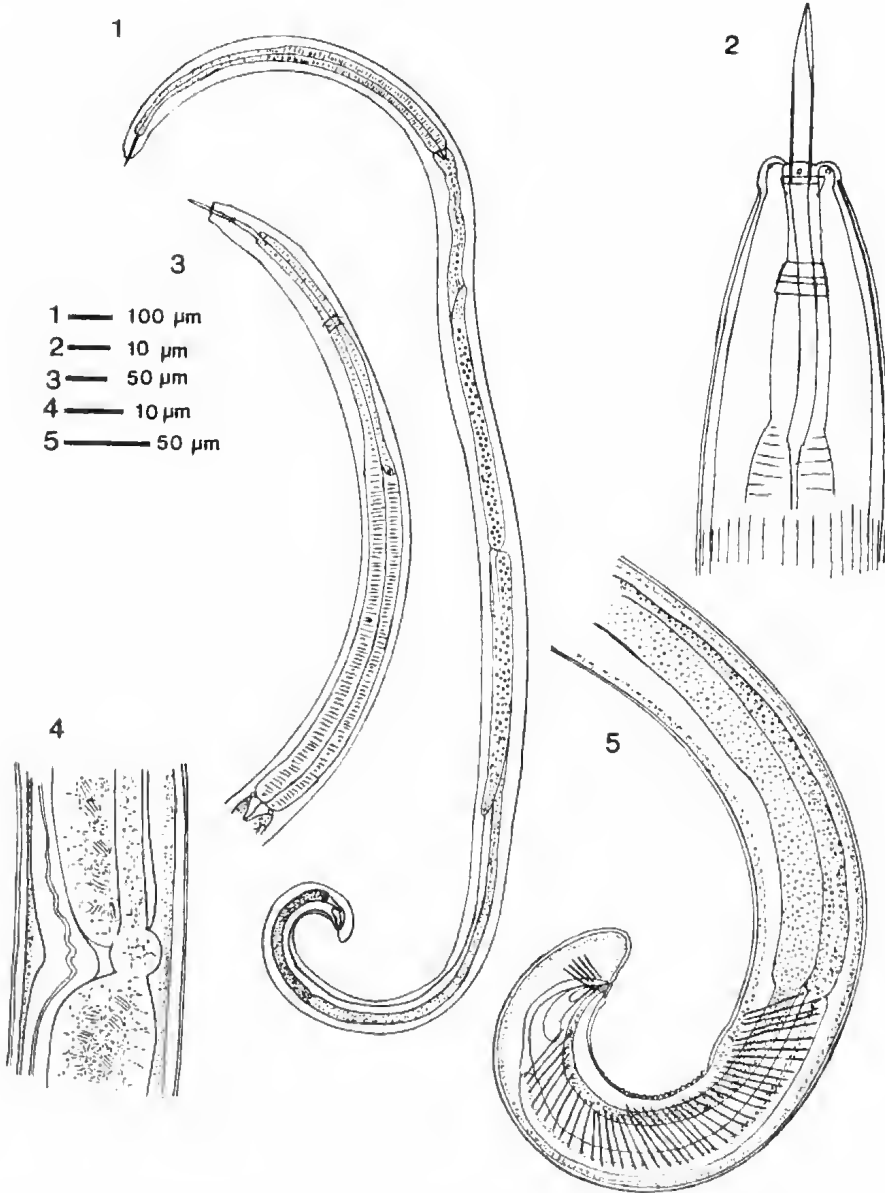
Holotype: ♂, ANIC 81-340, I. Bayly, Warumbi Hill, near Papunya, NT, 5.v.98.

Paratypes: 6 ♂♂, ANIC 81-341 to 346, 6 ♀♀, ANIC 81-347 to 351, I. Bayly, Warumbi Hill, near Papunya, NT, 5.v.98.

Measurements: Table 1.

Description of Holotype male (Figs 1-5)

Body large, slender, cylindrical. Tapered cervical region, six rounded slightly offset lips. Tail short, rounded. Cuticle very finely annulated in cervical region (below resolution of the light microscope, but visible with SEM), with 28-32 longitudinal ridges at mid body. Amphidial fovea stirrup-shaped, aperture a longitudinal slit just behind lips. Odontostyle straight, strongly built, 10 x diameter or 2.3 x width of lips, aperture 45% of length, guide



Figs 1-5. *Dorylaimus baylyi* sp. nov. male. 1. Entire holotype. 2. Head with odontostyle fully protruded. 3. Pharyngeal region. 4. Junction of two testes with vas deferens. 5. Posterior of body and copulatory organs.

ring double. Odontophore slightly curved, slightly longer than odontostyle. Pharynx cylindrical, muscular throughout its length, narrow at odontophore junction, expanded half way along its length, nerve ring 25% of pharynx length from head end, with dorsal pharyngeal gland adjacent to expansion. Cardia triangular, with length greater than diameter, enclosed by anterior intestine. Gland cells between pharynx and intestine present. Intestine slightly sinuous to level of anterior testis, compressed by gonads, a relatively wide straight tube from level of posterior testis to preectum. Preectum short, straight, tubular, set off from intestine by sphincter muscle, terminating in narrow, cuticle-lined rectum. Diuretic, testes not reflexed, mature spermatozoa filiform, in clusters, vas deferens a straight tube, on left side of intestine near anterior end and ventral to intestine at posterior end, ejaculatory duct not distinct from vas deferens. Prominent oblique copulatory muscles from anterior to posterior of preectum. Spicules

identical, dorylaimoid, ventrally areolate, with capitulum and lateral guiding pieces (ceruria). Supplements, adanal pair, then gap, then row of 22 contiguous supplements.

Paratype males

Similar to holotype, but numbers in row of supplements differ from 22-25. Number of longitudinal cuticle ridges very difficult to count but probably in range 28-32.

Paratype females (Figs 6-14)

Females resemble males in most characters, apart from reproductive system and tail, which is conoid ending in short flagellum. Females didelphic and amphidelphic with reflexed ovaries. Scanning electron micrographs of one additional female (Figs 11-14) show that ridges present in the mid body region cease on tail and cervical region. Very fine annulations, below resolution of light microscope, evident in cervical region and vulva is small oval pore.

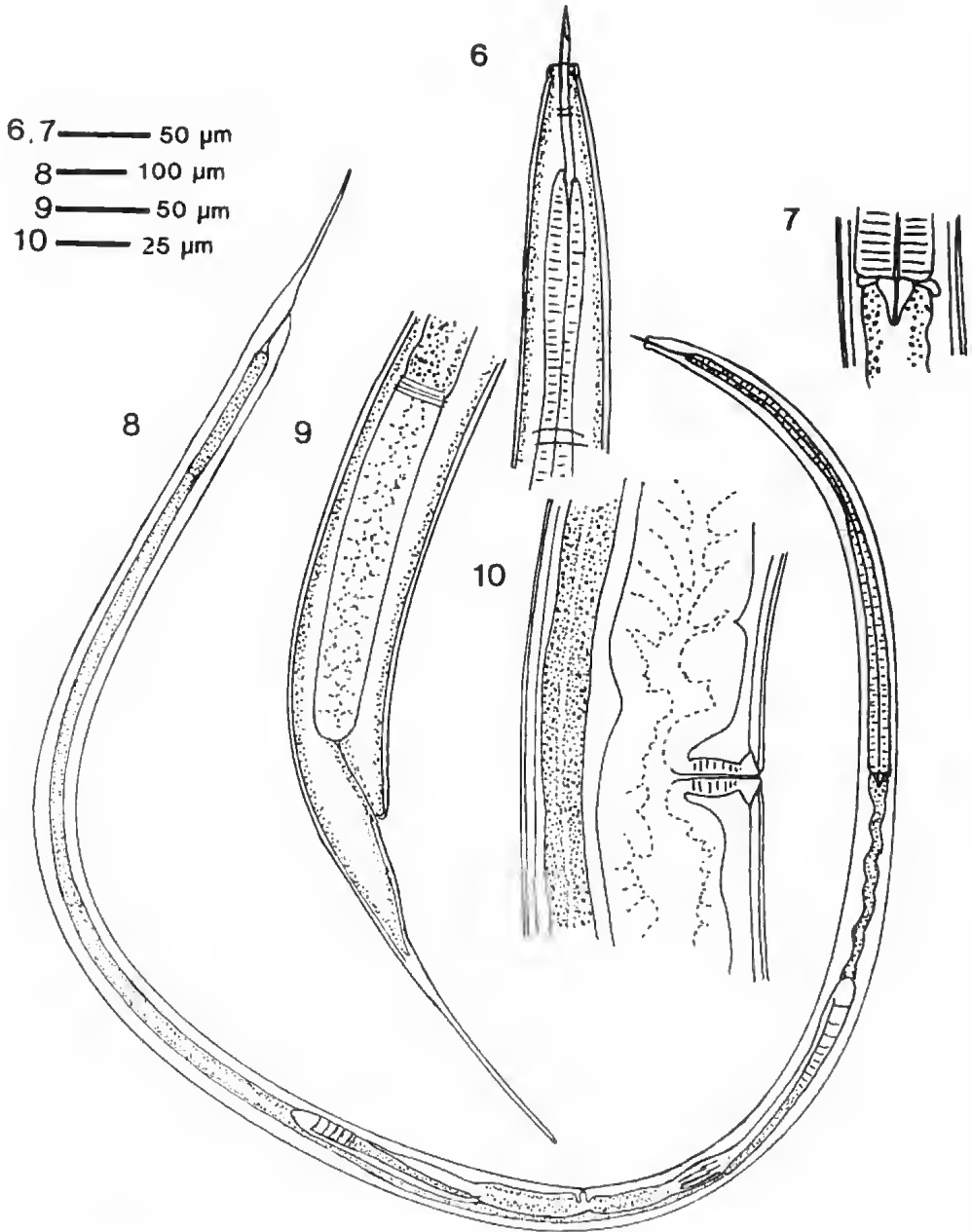
TABLE 1. Measurements (μm) of *Dorylaimus baylyi* sp. nov.

Type	Male/Holotype			Male/Para n=6			Female/Para n=6		
		Mean	Range	Mean	Range	SD	Mean	Range	SD
Length	3748	3872	3345-4313	382	4044	3425-4352	366		
Max. width	70	71.5	62-82	7.4	76	66-83	8.4		
Width at lips	19	18	16-21	1.9	19	18-19	0.5		
Odontostyle length	44	45	43-46	1.2	45	43-46	1.2		
Odontostyle aperture	19	19	17-22	2.0	19	17-22	2.1		
Odontophore length	57	61	55-65	3.7	60	39-66	10.3		
Head to amphid opening	5	6.1	3.9-10	2.3	7	3.9-9.5	2.4		
Head to guide ring	26	26	23-28	1.8	29	25-35	4.9		
Head to nerve ring	190	191	175-201	11.6	197	180-216	17		
Head to pharyngeal expansion	423	395	343-450	41	396	342-423	28		
Head to end of pharynx	846	819	768-866	36	877	846-887	17		
Width at cardia	70	55	61-71	4.4	71	64-81	6.3		
Head to tip of anterior gonad	1188	1302	1128-1531	159	1315	1128-1572	191		
Head to vulva	-	-	-	-	1871	1612-2257	303		
Head to vas deferens	1814	1721	1625-1828	77	-	-	-		
Head to tip of posterior gonad	2476	2326	1828-2982	399	2284	1781-2518	379		
Preectum length	221	199	130-250	49	240	200-350	46		
Rectum length	79	72	60-81	82	64	50-86	13		
Head to anus	3708	3829	3307-4347	377	3807	3253-4142	340		
Tail length	40	43	38-58	5.9	237	190-295	46		
Width at anus	45	45	41-49	3.2	36	30-42	5.1		
Spicule length	57	56	55-61	2.4	-	-	-		
Number of supplements in row	22	21	22-28	2.4	-	-	-		
Anus to supplement row	79	83	74-117	16	-	-	-		
Length of supplement row	71	97	71-156	33	-	-	-		
De Man's a	54	55	46-66	7.6	54	48-67	7		
De Man's b	1.1	5.0	4.4-5.1	0.3	1.6	3.9-5.0	0.4		
De Man's c'	94	91	77-99	7.0	17	15-20	3		
De Man's c	0.9	1.1	0.8-1.3	0.2	6.6	6.0-7.0	7.0		
De Man's V%	-	-	-	-	46	41-53	5.4		

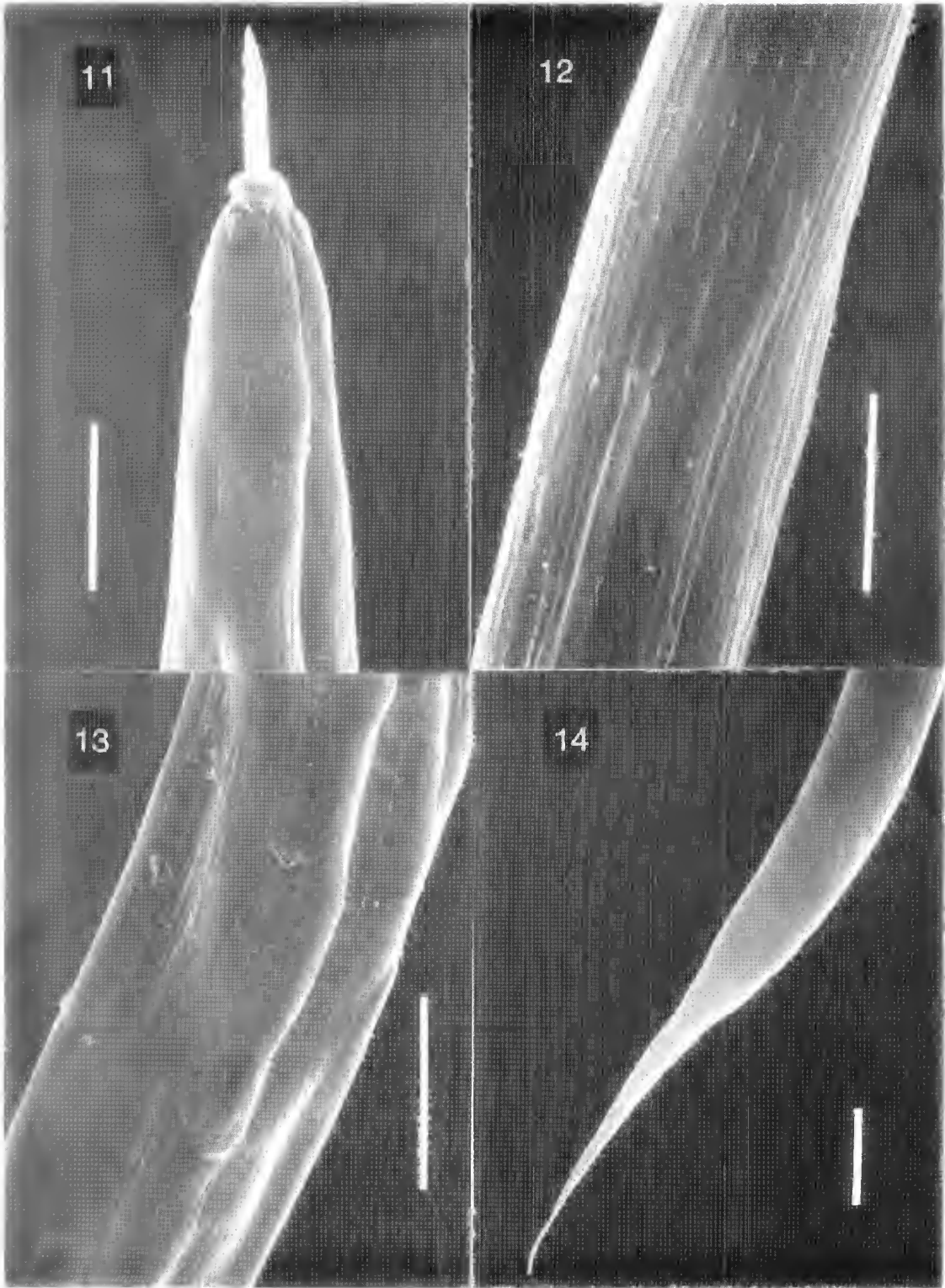
Differential diagnosis

Dorylaimus baylyi sp. nov. differs from all other species of the genus in spicule length, number of longitudinal ridges in cuticle, length of tail in adult females and lack of papillae near vulva. *Dorylaimus baylyi* sp. nov. differs from the closest species (*D. siddiqii* Ahmad & Jairajpuri 1982) in having a longer odontostyle (44-46 μm cf. 35-36 μm in *D. siddiqii*),

a shorter tail in adults of both sexes (De Man's $c = 15-21$ cf. 14 in *D. siddiqii* for adult females and 77-99 cf. 53-64 in *D. siddiqii* in adult males) and having fewer ventromedian supplements (22-25 cf. 31-34). *Dorylaimus baylyi* sp. nov. is also similar to *D. deaconi* Botha & Heyns (1991). Both have very fine annulations in the cervical region anterior to the full development of the longitudinal ridges but *D. baylyi*



Figs 6-10, *Dorylaimus baylyi* sp. nov. female paratype. 6. Head and cervical region. 7. Cardia. 8. Entire female. 9. Tail. 10. Vulval region.



Figs 11-14. Scanning electron micrographs of female *Dorylaimus baylyi* sp. nov. 11. Head and cervical region. 12. Mid region of body showing cuticular ridges. 13. Vulva. 14. Tail. Scale bars = 50 μ m.

sp. nov. has fewer longitudinal ridges (28-32 cf. 33 in *D. deaconi*), a longer odontophore (56-66 μm cf. 43-53 μm), much shorter spicules (55-61 μm cf. 71-86 μm), fewer supplements (22-25 cf. 35-42) and the vulva pore-like rather than a longitudinal slit. *Dorylaimus baylyi* sp. nov. differs from the very widespread *D. stagnalis* in the ratio of length to diameter of the odontostyle (10 cf. 6.7-7.3 in *D. stagnalis*), the odontostyle being shorter (43-46 μm cf. 47-51 μm), the odontostyle aperture being relatively longer (0.37-0.43 of the total length cf. 0.33), having fewer supplements (22-25 cf. 30-40), having much shorter spicules (55-61 μm cf. 100-110 μm) and in having filiform spermatozoa (ovoid in *D. stagnalis*) (Abebe & Coomans 1992; Mulvey & Anderson 1979).

Type locality and habitat

Freshwater rock-hole (gamma).

Distribution

Known only from Warumbi Hill, 3 km from

Papunya in The Northern Territory (23°15' S, 131°54' E). Collected by I. Bayly 5.v.98.

Etymology

In gratitude to Dr Ian Bayly for the specimens, we named the new species after him.

Remarks

Baermann extraction of mud samples from a later collection at the same rock-pool produced *Mesodorylaimus rotundolabiatus* Basson & Heyns (1974) and *Heterocephalobus* sp. (Cephalobidae). These specimens are also deposited in the ANIC Nematode collection. *M. rotundolabiatus* as ANIC 81-352.

Acknowledgments

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